

AMENDMENTS TO THE CLAIMS

LISTING OF CLAIMS:

Claim 1. (Withdrawn) An enzyme comprising a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence, said recombinant polypeptide having alcohol and aldehyde dehydrogenase activity.

Claim 2. (Withdrawn) An enzyme of claim 1, wherein the recombinant polypeptide is a chimeric polypeptide including a combination of at least two amino acid sequences each of said sequences being selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence.

Claim 3. (Withdrawn) An enzyme of claim 1, wherein the enzyme includes at least two recombinant polypeptides in the form of at least one of a homodimer and a heterodimer.

Claim 4. (Previously presented) An isolated nucleic acid molecule encoding a recombinant polypeptide comprising SEQ ID NO:5 or a polypeptide with at

least 80% identity to SEQ ID NO:5, and having alcohol and aldehyde dehydrogenase (AADH) activity.

Claim 5. (Previously presented) An isolated nucleic acid molecule of claim 4, wherein the nucleic acid molecule is selected from the group consisting of a linear DNA, a circular DNA and an insertion DNA fragment on a chromosome.

Claim 6. (Previously presented) A recombinant expression vector comprising a DNA sequence selected from the group consisting of SEQ ID NO:1 and DNA sequences which encode a polypeptide with at least 80% identity to SEQ ID NO:5 and having alcohol and aldehyde dehydrogenase activity.

Claim 7. (Previously presented) A recombinant expression vector comprising a DNA sequence selected from the group consisting of SEQ ID NO:1 and DNA sequences which encode a polypeptide with at least 80% identity to SEQ ID NO:5, wherein the DNA sequence is functionally linked to one or more genetic control sequences and is capable of expression of an enzyme including at least one recombinant polypeptide having alcohol and aldehyde dehydrogenase activity.

Claim 8. (Previously presented) A recombinant expression vector of claim 7 which is pSSA102R.

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Claim 9. (Withdrawn) An enzyme encoded by at least one DNA molecule of a recombinant expression vector of claim 8.

Claim 10. (Previously presented) A host cell transformed with the recombinant expression vector of claim 6.

Claim 11. (Previously presented) A host cell transformed with the nucleic acid molecule of claim 4.

Claim 12. (Cancelled).

Claim 13. (Currently amended) The host cell A recombinant organism of claim 10, wherein the host cell is a bacterium.

Claim 14. (Currently amended) The host cell A recombinant organism of claim 10, wherein the host cell is selected from the group consisting of *Escherichia coli*, *Pseudomonas putida*, *Acetobacter xylinum*, *Acetobacter pasteurianus*, *Acetobacter aceti*, *Acetobacter hansenii*, and *Gluconobacter oxydans*.

Claim 15. (Currently amended) The host cell A recombinant organism of claim 10, wherein the host cell is *Gluconobacter oxydans*.

Claim 16. (Currently amended) A process for producing a recombinant enzyme having an alcohol and aldehyde dehydrogenase activity comprising:

(a) culturing a host cell ~~recombinant organism~~ comprising an expression vector comprising a DNA molecule encoding a recombinant polypeptide containing an amino acid sequence with at least 80% identity to the polypeptide sequence of SEQ ID NO:5 in an appropriate culture medium; and

(b) recovering the recombinant enzyme.

Claim 17. (Withdrawn) A process for producing an aldehyde product from a substrate comprising the steps of culturing a recombinant organism of claim 10 in a medium containing the substrate, wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the aldehyde product.

Claim 18. (Withdrawn) A process for producing a ketone product from a substrate comprising the steps in culturing a recombinant organism of claim 10 in a medium containing the substrate, wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the ketone product.

Claim 19. (Withdrawn) A process for producing a carboxylic acid product from a substrate comprising the steps of culturing a recombinant organism of

claim 10 in a medium containing the substrate, wherein said substrate is selected from the group consisting of L-sorbose, D-glucose, D-fructose and L-sorbose, and recovering the carboxylic acid product.

Claim 20. (Withdrawn) A process for producing an aldehyde product from a substrate which comprises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the aldehyde product.

Claim 21. (Withdrawn) A process for producing a ketone product from a substrate which comprises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of n-propanol, isopropanol, D-sorbitol and D-mannitol, and recovering the ketone product.

Claim 22. (Withdrawn) A process for producing a carboxylic acid product from a substrate which comprises incubating a reaction mixture containing an enzyme of claim 1 and said substrate wherein said substrate is selected from the group consisting of L-sorbose, D-glucose, D-fructose and L-sorbose, and recovering the carboxylic acid product.

Claim 23. (Withdrawn) A process for producing 2-keto-L-gulonic acid from L-sorbose comprising the steps of culturing a recombinant organism of claim 10 in a medium containing L- sorbose and recovering the 2-keto-L-gulonic acid.

Claim 24. (Withdrawn) A process for producing 2-keto-L-gulonic acid from D-sorbitol comprising the steps of culturing a recombinant organism of claim 10 in a medium containing D-sorbitol and recovering the 2-keto-L-gulonic acid.

Claim 25. (Withdrawn) A process for producing 2-keto-L-gulonic acid which comprises:

a) incubating a reaction mixture containing a substrate selected from the group consisting of D-sorbitol and L-sorbose, and a recombinant enzyme including a recombinant polypeptide containing an amino acid sequence selected from the group consisting of SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, SEQ ID NO 8, and amino acid sequences which contain addition, insertion, deletion and/or substitution of one or more amino acid residues in said sequence, said recombinant polypeptide having alcohol and aldehyde dehydrogenase activity, and

b) converting the substrate to 2-keto-L-gulonic acid.

Claim 26. (Withdrawn) A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 23 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

Claim 27. (Withdrawn) A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 24 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

Claim 28. (Withdrawn) A process for the production of L-ascorbic acid from 2-keto-L-gulonic acid comprising obtaining 2-keto-L-gulonic acid by a process of claim 25 and transforming the 2-keto-L-gulonic acid into L-ascorbic acid.

Claim 29. (Previously presented) An isolated polynucleotide comprising SEQ ID NO:1.

Claim 30. (Currently amended) An isolated polynucleotide consisting ~~of comprising~~ a polynucleotide sequence encoding a ~~polypeptide fragment consisting of~~ amino acid residues 1 to 95 of SEQ ID NO:5.

Claim 31. (Currently amended) An isolated polynucleotide consisting ~~of comprising~~ a polynucleotide sequence encoding a ~~polypeptide fragment consisting of~~ amino acid residues 1 to 135 of SEQ ID NO:5.

Claim 32. (Cancelled).

Claim 33. (Previously presented) A recombinant microorganism comprising expression vector pSSA102R.

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Claim 34. (Currently amended) A recombinant expression vector comprising a polynucleotide sequence according to any one of claims 29-31 ~~32~~, 37 and 38.

Claim 36. (Currently amended) The host cell ~~A recombinant organism~~ according to claim 11 wherein the host cell ~~organism~~ is selected from the group consisting of a microorganism, a mammalian cell, and a plant cell.

Claim 37. (New) An isolated polynucleotide consisting of a polynucleotide sequence encoding amino acid residues 1 to 125 of SEQ ID NO:5.

Claim 38. (New) An isolated polynucleotide consisting of a polynucleotide sequence encoding amino acid residues 1 to 128 of SEQ ID NO:5.